

ABSTRACT

A dynamically adjustable digital gyrator device for a telephone line interface (e.g., a DAA) utilizing extended feedback and a dynamically adjustable filter to achieve stable convergence in the control of DC line current on a telephone line a short period of time.

The low pass filter of the digital gyrator includes at least two (2) different fast filter settings and at least two (2) different slow filter settings based on possible load terminations (e.g., PBX, TAS, etc.), which can be determined based on the dynamic detection of an oscillation on the line. For instance, in a disclosed example, a voice band modem system is allowed to go off-hook with a 1 Hz cutoff low pass filter, and then the output of the low pass filter is checked for an oscillation. If an oscillation is detected, then the poles and/or zeroes of the low pass filter cutoff are changed to a slower convergence rate cutoff frequency (e.g., to 0.1 Hz). As a result, the exemplary voice band modem will converge stably and quickly (e.g., in less than 1 second) before dialing begins. By controlling the DC line current digitally, software can be used to set the DC line current in accordance with predefined characteristics. Predefined characteristics can be set to accommodate varying country specifications instead of using switches to control resistors and capacitors.